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U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER  
10191/1882

**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371**

U.S. APPLICATION-NO (If known, see 37 CFR 1.5)

**10/018066**

INTERNATIONAL APPLICATION NO.  
PCT/DE00/01166

INTERNATIONAL FILING DATE  
(14.04.00)  
14 April 2000

PRIORITY DATE(S) CLAIMED  
(27.04.99)  
27 April 1999

TITLE OF INVENTION  
**DEVICE AND METHOD FOR CONTROLLING WHEEL SLIP**

APPLICANT(S) FOR DO/EO/US

**Volker BECKER**

Applicant(s) herewith submit to the United States Designated/Elected Office (DO/EO/US) the following items and other information

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) immediately rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)) (unsigned).
10. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.  
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☒ A substitute specification and a marked up version thereof.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: International Search Report, International Preliminary Examination Report and Form PCT/RO/101.

Express Mail No. **EV 00362432845**

U.S. APPLICATION NO. if known, see 37 C.F.R.1.5  <div style="font-size: 2em; font-weight: bold; margin-left: 50px;">10/018066</div>	INTERNATIONAL APPLICATION NO  PCT/DE00/01166	ATTORNEY'S DOCKET NUMBER  10191/1882
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17. <input checked="" type="checkbox"/> The following fees are submitted:  <b>Basic National Fee (37 CFR 1.492(a)(1)-(5)):</b> Search Report has been prepared by the EPO or JPO . . . . . \$890.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) . . . \$710.00  No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) . . . . . \$740.00  Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO . . . . . \$1,040.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) . . . . . \$100.00	<div style="border-bottom: 1px solid black; margin-bottom: 5px;">CALCULATIONS</div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;">PTO USE ONLY</div>
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ENTER APPROPRIATE BASIC FEE AMOUNT =	\$ 890	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	\$	

Claims	Number Filed	Number Extra	Rate		
Total Claims	14 - 20 =	0	X \$18.00	\$ 0	
Independent Claims	1 - 3 =	0	X \$84.00	\$ 0	
Multiple dependent claim(s) (if applicable)			+ \$280.00	\$ 0	
TOTAL OF ABOVE CALCULATIONS =				\$ 890	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				\$	
SUBTOTAL =				\$ 890	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				+	\$
TOTAL NATIONAL FEE =				\$ 890	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				+	\$
TOTAL FEES ENCLOSED =				\$ 890	

	Amount to be:	
	refunded	\$
	charged	\$

a. ☐ A check in the amount of \$ \_\_\_\_\_ to cover the above fees is enclosed.

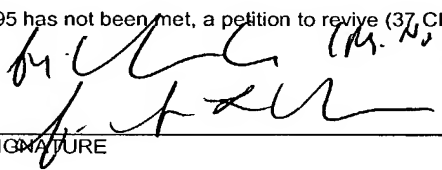
b. ☒ Please charge my Deposit Account No. 11-0600 in the amount of \$890.00 to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 11-0600. A duplicate copy of this sheet is enclosed.

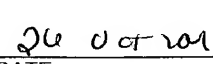
**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Kenyon & Kenyon  
One Broadway  
New York, New York 10004  
**CUSTOMER NO. 26646**



  
 Richard L. Mayer, Reg. No. 22,490  
 NAME



  
 DATE

10013110/018066

JC05 Rec'd PCT/PTO 26 DEC 2007

[10191/1882]

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s) : Volker BECKER  
Serial No. : To Be Assigned  
Filed : Herewith  
For : METHOD FOR SELECTING  
A STORAGE MEDIUM  
Art Unit : To Be Assigned  
Examiner : To Be Assigned

Assistant Commissioner  
for Patents  
Washington, D.C. 20231

**PRELIMINARY AMENDMENT AND  
37 C.F.R. § 1.125 SUBSTITUTE SPECIFICATION STATEMENT**

SIR:

Please amend without prejudice the above-identified application before examination, as set forth below.

**IN THE TITLE:**

Please amend without prejudice the title to be:  
--METHOD FOR SELECTING A STORAGE MEDIUM--.

**IN THE SPECIFICATION AND ABSTRACT:**

In accordance with 37 C.F.R. § 1.121(b)(3), a Substitute Specification (including the Abstract, but without claims) accompanies this response. It is respectfully requested that the Substitute Specification (including Abstract) be entered to replace the Specification of record.

**IN THE CLAIMS:**

Without prejudice, please cancel original claims 1 to 10 and new/substitute claims 1 to 9, and please add new claims 10 to 23 as follows:

–10. (New) A method for selecting a storage medium from a plurality of storage mediums assigned to a playback device for reading out and reproducing stored data, and which is storable in a storage arrangement, the method comprising:

determining a playback probability as a function of a time assigned to the playback device for a respective storage medium for reading out and reproducing stored data, wherein the time is longer for a determined lower playback probability for the respective storage medium; and

releasing one storage medium of the plurality of storage mediums having a lowest playback probability for ejection from one of the playback device and from the storage arrangement.

11. (New) The method of claim 10, wherein in the step of releasing, the one storage medium is released if there is an ejection prompt.

12. (New) The method of claim 11, wherein an ejection prompt is provided when a supply arrangement for storing the plurality of storage mediums is full, and an additional storage medium is to be inserted into one of the playback device and the storage arrangement when the ejection prompt is detected.

13. (New) The method of claim 11, wherein the ejection prompt is provided when a suitable operating function is activated at the one of the playback device and the storage arrangement.

14. (New) The method of claim 10, wherein the playback probability is determined as a function of a frequency with which stored data of the one storage medium is read out and reproduced by the playback device, and the playback probability for the one storage medium is determined to be greater for a greater frequency.

15. (New) The method of claim 14, wherein less current read-out operations and reproduction operations are given a lesser valuation when determining the frequency.

16. (New) The method of claim 10, further comprising:

releasing for ejection another storage medium of the plurality of storage mediums differing from the one storage medium and having a next lowest playback probability, in

response to one of the one storage medium being released for ejection for a predefined time of not being removed and the one storage medium being reinserted.

17. (New) The method of claim 10, further comprising storing one of a non-removal of the one storage medium released for ejection for a predefined time and reinsertion of the one storage medium;

wherein:

the playback probability for the one storage medium is determinable as a function of one of a stored non-removal and a stored reinsertion; and

the playback probability for the one storage medium is determined to be greater for one of the non-removal and the reinsertion.

18. (New) The method of claim 10, wherein at least one selection operation for ejecting the one storage medium initiated at an operator device is stored, and playback probabilities for the plurality of storage mediums are determinable as a function of at least one stored selection operation.

19. (New) The method of claim 10, wherein the storage medium includes an optical storage disk.

20. (New) The method of claim 10, wherein the playback device includes a compact disk changer.

21. (New) The method of claim 10, wherein the storage medium includes an optical storage disk, and the playback device includes a compact disk changer.

22. (New) The method of claim 12, wherein the ejection prompt is detected by a proximity sensor.

23. (New) The method of claim 13, wherein the suitable operating function is activated by manipulating a button.--

**Remarks**

This Preliminary Amendment cancels without prejudice original claims 1 to 10 and new/substitute claims 1 to 9 in the underlying PCT Application No. PCT/DE00/01166, and adds without prejudice new claims 10 to 23. The new claims conform the claims to U.S. Patent and Trademark Office rules and do not add new matter to the application.

In accordance with 37 C.F.R. § 1.121(b)(3), the Substitute Specification (including the Abstract, but without the claims) contains no new matter. The amendments reflected in the Substitute Specification (including Abstract) are to conform the Specification and Abstract to U.S. Patent and Trademark Office rules or to correct informalities. As required by 37 C.F.R. § 1.121(b)(3)(iii) and § 1.125(b)(2), a Marked Up Version Of The Substitute Specification comparing the Specification of record and the Substitute Specification also accompanies this Preliminary Amendment. In the Marked Up Version, underlining indicates added text and bracketing indicated deleted text. Approval and entry of the Substitute Specification (including Abstract) is respectfully requested.

The underlying PCT Application No. PCT/DE00/01166 includes an International Search Report, dated October 5, 2000. The Search Report includes a list of documents that were uncovered in the underlying PCT Application. A copy of the Search Report accompanies this Preliminary Amendment.

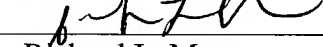
The underlying PCT application also includes an International Preliminary Examination Report, dated April 19, 2001, and an annex (including new/substitute claims 1 to 9). An English translation of the International Preliminary Examination Report and the annex accompanies this Preliminary Amendment.

Applicant asserts that the subject matter of the present application is new, non-obvious, and useful. Prompt consideration and allowance of the application are respectfully requested.

Respectfully Submitted,

KENYON & KENYON (N.Y. No. 36098)

Dated: 26 OCT 2001

By:   
Richard L. Mayer  
(Reg. No. 22,490)

One Broadway  
New York, NY 10004  
(212) 425-7200

**CUSTOMER NO. 26646**

## METHOD FOR SELECTING A STORAGE MEDIUM

FIELD OF THE INVENTION

The present invention relates to a method for selecting a storage medium, in particular an optical storage disk, from a plurality of storage mediums, which are assigned to a playback device, in particular a compact disk changer, for reading out and reproducing stored data, and which can be stored in a storage apparatus, arrangement or structure.

BACKGROUND INFORMATION

Compact disk changer CDC-F 05, for example, where up to ten different compact disks are assigned to a playback device for reading out and reproducing stored data and can be stored in a magazine is discussed in the Blaupunkt catalog "Sound und Fahrvergnügen pur. Mobile Kommunikation von Blaupunkt. Programm 96/97." [Pure Sound and Driving Pleasure. Mobile Communication from Blaupunkt. Program 96/97]. In this context, a compact disk to be played back in the assigned playback device, for example, can be selected.

SUMMARY OF THE INVENTION

In contrast, the exemplary method and/or exemplary embodiment according to the present invention is believed to have the advantage that a playback probability is determined for each storage medium, and that the storage medium having the lowest playback probability is released to be ejected from the playback device or from the storage apparatus, arrangement or structure. In this manner, the decision regarding the ejection of a no longer needed storage medium is automated. This should eliminate or at least reduce the effort for a user to inform himself as to the storage mediums located in the storage

SUBSTITUTE SPECIFICATION



apparatus, arrangement or structure, to then select a no longer necessary storage medium, and to be able to release it for ejection. Thus, the user may be spared from obtaining an overview of the storage mediums stored in the storage

5 apparatus, arrangement or structure and selecting the no longer needed storage medium for ejection, e.g. by way of naming the storage mediums in the storage apparatus, arrangement or structure, initiating the play of individual storage mediums or even removing individual storage mediums by  
10 way of trial and subsequently examining a label on the individual storage mediums. Thus, the handling time for ejecting a no longer needed storage medium may be significantly reduced.

15 In this context, it may be particularly advantageous that an ejection prompt is generated when the supply apparatus, arrangement or structure for storing the storage mediums is full, or when it is detected, which may be by proximity sensors, that an additional storage medium is to be inserted  
20 into the playback device or into the storage apparatus, arrangement or structure. In this manner, the user's handling time is solely limited to his specific intention of inserting a new storage medium. In the case of an already completely filled storage apparatus, arrangement or structure, the user  
25 may no longer need to select a no longer needed storage medium for ejection prior to an additional storage medium being inserted.

An additional advantage may be that the playback probability  
30 is determined as a function of the time that was assigned for the storage medium in question to the playback device for reading out and reproducing stored data, and that the longer this time was, the lower the playback probability for this storage medium is determined to be. In this manner, the  
35 storage medium first inserted into the storage apparatus, arrangement or structure or the playback device may also be

the first to be ejected. Thus, the storage medium that has been in the storage apparatus, arrangement or structure or in the playback device the longest can be the first to be ejected.

5

A further advantage is that the playback probability may be determined as a function of the frequency with which the stored data of the storage medium in question is read out and reproduced by the playback device, and that the greater this frequency is, the greater (higher) the playback probability for this storage medium is determined to be. In this manner, a preferred storage medium having the greatest playback frequency can be spared the ejection operation.

15 An additional advantage is that, when determining frequency, less current read-out operations and reproduction operations are given a lesser valuation. In this manner, the historic development of the playback frequency of all of the storage mediums in the playback device can be taken into  
20 consideration. As a result, trends in the playback frequency can be recognized and drawn upon as ejection criteria. This can also result in a preferred storage medium being released for ejection at some instant without its playback frequency having to be exceeded by other storage mediums, namely when  
25 the preference for the storage medium in question is no longer current.

A further advantage is that in response to the storage medium released for ejection for a predefined time not being removed or such a storage medium being reinserted, a storage medium  
30 differing from this storage medium and having the next greater (next one up, or next lowest) playback probability is released for ejection. In this manner, the wish of the user to continue to store the storage medium released for ejection in the  
35 playback device or in the storage apparatus, arrangement or structure can be taken into consideration, so that the

selection of the storage mediums to be ejected is adapted to the needs of the user.

5 An additional advantage is that the non-removal of a storage medium released for ejection for a predefined time or the reinsertion of such a storage medium is stored, that the playback probability for this storage medium is determined as a function of this stored non-removal or of the stored reinsertion, and that the playback probability for this  
10 storage medium in the case of non-removal or reinsertion is determined to be greater. In this manner, the wish of the user to continue to store a storage medium proposed for ejection in the playback device or in the storage apparatus, arrangement or structure is also taken into account for future selection  
15 operations in that the playback probability for the corresponding storage medium is accordingly adapted to the user's actions.

20 A further advantage is that selection operations for ejecting storage mediums initiated at an operator device are stored, and that playback probabilities for the storage mediums may be determined as a function of the stored selection operations. In this manner, the user's strategy can be observed, the playback device being capable of learning from  
25 the user's individual selection actions and of emulating them when selecting the storage medium to be provided for ejection. In this manner, the exemplary method for selecting a storage medium is increasingly adapted to the user's needs over time and thereby optimized.

#### BRIEF DESCRIPTION OF THE DRAWINGS

30 Figure 1 shows a block diagram of a playback device.

35 Figure 2 shows a flow diagram for carrying out the exemplary method and/or for use in an exemplary embodiment according to the present invention, for selecting a storage medium.

DETAILED DESCRIPTION

In Figure 1 is shown a playback device 15, which can be configured as a compact disk changer, for example. Playback device 15 includes a storage apparatus, arrangement or structure 20, which can be configured as a magazine of a compact disk changer, for example. Storage apparatus, arrangement or structure 20 includes a first storage space 21, a second storage space 22, and a third storage space 23. A first storage medium 1 is stored in first storage space 21. A second storage medium 5 is stored in second storage space 22. A third storage medium 10 is stored in third storage space 23. Storage mediums 1, 5, 10 can, for example, be configured as optical storage disks, i.e., as compact disks or as CD-ROMs or as digital video disks or DVDs. However, storage mediums 1, 5, 10 can also be magnetic storage disks, playback device 15 being then configured as a playback device for magnetic storage disks.

Storage apparatus, arrangement or structure 20 is connected at one end to a playback unit 40 for playing back a storage medium and at the other end to a controller 35. In addition, a proximity sensor 25, a memory unit 45, and an operator device 30 are connected to controller 35. Playback unit 40 is likewise connected to controller 35 as well as to memory unit 45. Proximity sensor 25 is situated in the vicinity of an input slot (not shown in Figure 1) of playback device 15 or of storage apparatus, arrangement or structure 20. Playback unit 40 can be assigned to each of the three storage spaces 21, 22, 23. Figure 1 shows first storage space 21 assigned to playback unit 40.

Via operator device 30, a user of playback device 15 can select one of storage mediums 1, 5, 10 for the data stored on the storage medium to be read out and reproduced via playback unit 40. In this context, first storage medium 1 in first storage space 21, for example, is to have been selected by the

user. First storage medium 1 is then transported from first storage space 21 of storage apparatus, arrangement or structure 20 to playback unit 40 and deposited there, so that it can be read out by a read device (not shown in Figure 1) of playback unit 40 and reproduced by a reproduction device (likewise not shown in Figure 1).

The reproduction device can be an optical display device and/or at least one loudspeaker, depending on whether audio data and/or video data are being read from first storage medium 1. It can be provided that the frequency with which storage mediums 1, 5, 10 are selected for reading out and reproducing the stored data is stored in memory unit 45.

Additionally or alternatively, the sequence in which storage mediums 1, 4, 10 are inserted into playback device 15 or into storage apparatus, arrangement or structure 20 can be stored in memory unit 45. It can also be provided that, using the operator device, the user can select a storage medium in a storage space of storage apparatus, arrangement or structure 20 to be ejected from playback device 15 or from storage apparatus, arrangement or structure 20 via the input slot not shown in Figure 1.

For such a selection, the user can, for example, use a naming of storage mediums 1, 5, 10 in storage apparatus, arrangement or structure 20, previously carried out via operator device 30, to orientate himself, as long as a display device (not shown in Figure 1) connected to controller 35 is provided on which each of the names of storage mediums 1, 5, 10 can be represented. The user can also make a selection in that the individual storage mediums 1, 5, 10 are supplied one after another to playback unit 40 to initiate play, i.e., to be partially read out and reproduced, so that the user can select the storage medium to be ejected based on the at least partial reproduction of the data stored on each storage medium 1, 5,

10.

Furthermore, the selection could be carried out via an  
ejection operating element (not shown in Figure 1) of operator  
5 device 30, activating the ejection operating element resulting  
in storage mediums 1, 5, 10 being able to be ejected in  
succession from playback device 15 or from storage apparatus,  
arrangement or structure 20, so that the user can make a  
selection based on the label of the storage medium in question  
10 and can reinsert the storage mediums not selected into  
playback device 15 or into storage apparatus, arrangement or  
structure 20, which, together with playback unit 40, e.g. a  
compact disk changer, can also be situated outside of playback  
device 15.

15 In this context, it can be provided that the selection  
operations initiated by the user at operator device 30 for  
ejecting storage mediums 1, 5, 10 are registered and are  
stored in memory unit 45 as a result of controller 35, so that  
20 the selection operations carried out by the user for ejecting  
storage mediums 1, 5, 10 are stored in memory unit 45.

Playback device 15 has a function via which a storage medium  
1, 5, 10 stored in storage apparatus, arrangement or structure  
25 20 or in playback unit 40 is automatically selected to be  
ejected, i.e., without the user making a selection. For this  
purpose, a playback probability is determined for each storage  
medium 1, 5, 10. The storage medium having the lowest playback  
probability is then released to be ejected from playback  
30 device 15 or from storage apparatus, arrangement or structure  
20.

In this context, according to Figure 1, first storage medium 1  
should have the lowest playback probability and be released  
35 for ejection from playback device 15 or from storage  
apparatus, arrangement or structure 20, as is indicated by the

corresponding arrow in Figure 1. In this context, first storage medium 1 can be released in the event that there is an ejection prompt. The existence of an ejection prompt can also be a prerequisite for controller 35 to calculate the playback probabilities of the individual storage mediums 1, 5, 10.

In the present exemplary embodiment, two different possibilities for producing such an ejection prompt are described. In this context, a suitable ejection prompt can be generated by operating, e.g. for a predefined minimum duration, the ejection operating element (not shown in Figure 1) of operator device 30 in a characteristic manner, or by operating an additional ejection operating element, e.g. in the form of a button, of operator device 30. In the case of a storage apparatus, arrangement or structure 20 offset from playback device 15, a corresponding ejection operating element can also be provided at storage apparatus, arrangement or structure 20.

The generation of the ejection prompt can also be carried out or performed by proximity sensor 25, for example. In the case that proximity sensor 25 detects in the vicinity of the input slot at playback device 15 or at storage apparatus, arrangement or structure 20 that an additional storage medium is to be inserted into playback device 15 or into storage apparatus, arrangement or structure 20, in that the additional storage medium is brought into the vicinity of the corresponding input slot and, as such, into the range of effect of proximity sensor 25, the ejection prompt is automatically generated, provided that storage apparatus, arrangement or structure 20 for storing storage mediums 1, 5, 10 is full.

In this context, storage apparatus, arrangement or structure 20 is detected as full when the number of storage mediums 1, 5, 10 in playback device 15 corresponds with the number of

storage spaces 21, 22, 23 of storage apparatus, arrangement or structure 20, at least one storage space 21, 22, 23 also being able to be empty, and the corresponding storage medium being in playback unit 40 to be read out and reproduced, for  
 5 example. In this context, storage apparatus, arrangement or structure 20 can have more or less than three storage spaces 21, 22, 23.

Different criteria can be provided individually or in  
 10 combination for determining the playback probability of the individual storage mediums 1, 5, 10. In this context, the playback probability can be determined as a function of the time that was assigned for the respective storage medium 1, 5, 10 to playback device 15 for reading out and reproducing  
 15 stored data. This is then possible when the sequence in which storage mediums 1, 5, 10 were inserted into playback device 15 or into storage apparatus, arrangement or structure 20 is stored in memory unit 45.

In this context, the storage medium inserted first has been assigned to playback device 15 the longest. In this context, the playback probability for the individual storage mediums 1, 5, 10 is determined by controller 35, and the longer the time, i.e., the earlier the corresponding storage medium 1, 5, 10  
 25 was inserted into playback device 15 or into storage apparatus, arrangement or structure 20, the lower the playback probability.

Additionally or alternatively, the playback probability can be  
 30 determined as a function of the frequency with which the stored data of each storage medium 1, 5, 10 are read out and reproduced by playback device 15. Prerequisite for this is that the corresponding frequency or playback instant is also stored in memory unit 45. In this context, the greater this  
 35 frequency is, the greater the playback probability determined in controller 35 is for the particular storage medium 1, 5,



10.

In this context, less current read-out operations and reproduction operations can also be given a lesser valuation for determining the frequency. In this manner, the historic development of the playback frequency of all of storage mediums 1, 5, 10 located in playback device 15 are taken into consideration, provided that the corresponding playback instant of these storage mediums 1, 5, 10 are stored in memory unit 45, which, for this purpose, may be configured as a non-volatile memory. Therefore, trends in the playback frequency can be detected by controller 35 and drawn upon as ejection criteria.

Additionally or alternatively to the described criteria for determining the playback probability, it can also be provided that, in the case that the user's selection operations initiated at operator device 30, for ejecting storage mediums 1, 5, 10 are also stored in memory unit 45, the playback probabilities for storage mediums 1, 5, 10 may be determined as a function of these stored selection operations. Consequently, controller 35 can observe the user's strategy for selecting storage mediums to be ejected and learn from the user's individual selection actions, so that the selection carried out by controller 35 is increasingly adapted to the user's needs over time and, thus, optimized.

Given the existence of an ejection prompt, the storage medium 1, 5, 10 having the lowest playback probability is released by controller 35 for ejection. In this context, the release may be carried out for a predefined time. According to Figure 1, first storage medium 1, for example, should have the lowest playback probability and, thus, be released. If first storage medium 1 is not removed after the predefined time or is reinserted into playback device 15 or into storage apparatus, arrangement or structure 20, controller 35 recognizes that the

user does not accept its selection and releases for ejection a storage medium 5, 10 other than storage medium 1, having the next greatest (next one up, or next lowest) playback probability.

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In this context, the exemplary method and/or exemplary embodiment may provide for the non-removal of a storage medium 1, 5, 10 released to be ejected for a predefined time or the reinsertion of such a storage medium 1, 5, 10 is stored in memory unit 45, and that controller 35 determines the playback probability for this storage medium 1, 5, 10 as a function of the stored non-removal or the stored reinsertion, the playback probability for this storage medium 1, 5, 10 being greater in the case of a stored non-removal or reinsertion.

15

In this context, the number of non-removals or reinsertions of the corresponding storage medium 1, 5, 10 can also be stored in memory unit 45, controller 35 determining the playback probability to be greater for the corresponding storage medium 1, 5, 10 when a greater number of non-removals or reinsertions has been stored.

20

Also in this manner, controller 35 adapts its selection method to the needs of the user, in that it takes the user's rejection of its selection proposals into account when determining the playback probability for storage mediums 1, 5, 10.

25

Analogously to the criteria for the frequency for reading out and reproducing a storage medium 1, 5, 10, it can further be provided that less current non-removals and reinsertions are given a lesser valuation when determining playback frequency. For this purpose, the historic development of the non-removals or reinsertions of all of the storage mediums 1, 5, 10 located in playback device 15 or in storage apparatus, arrangement or structure 20 must be accordingly stored in memory unit 45, so

30

35

that in this manner trends in the non-removal or reinsertion of storage mediums 1, 5, 10 can be likewise detected and drawn upon as ejection criteria.

5 In the event that controller 35 determines the lowest playback probability for more than one storage medium, i.e., the same lowest playback probability for the storage mediums, controller 35 randomly selects one of these storage mediums for ejection.

10

Figure 2 shows a flow diagram for the functioning method of controller 35, consideration, for example, of all indicated criteria for determining the playback probability being provided. At a program point 100, controller 35 checks whether  
15 there is an ejection prompt. If this is the case, the program branches to program point 105, otherwise the program is exited. At program point 105, controller 35 determines from memory unit 45 the times that were assigned for each storage medium 1, 5, 10 to playback device 15 for reading out and  
20 reproducing stored data.

Subsequently, the program branches to a program point 110. At program point 110, controller 35 determines from memory unit 45 the frequency with which the stored data of each storage  
25 medium 1, 5, 10 are read out or reproduced by playback device 15. In this context, the controller also takes from memory unit 45 the instants of the read-out operations and reproduction operations necessary for determining frequency. In this context, less current read-out operations and  
30 reproduction operations are given a lesser valuation by controller 35 when calculating the frequency for the individual storage mediums 1, 5, 10.

Subsequently, the program branches to a program point 120. At  
35 program point 120, controller 35 determines from memory unit 45 the selection operations initiated at operator device 30

for ejecting the individual storage mediums 1, 5, 10. In the event that the instants of the selection operations for ejecting the individual storage mediums 1, 5, 10, initiated at operator device 30 by the user are also stored in memory unit 45, these instants can be taken into consideration in addition to the valuation of the selection operations determined by controller 35, less current selection operations being given a lesser valuation. The program subsequently branches to a program point 125.

At program point 125, controller 35 determines from memory unit 45 the non-removals of storage mediums 1, 5, 10 released for ejection for a predefined time or the reinsertions of such storage mediums 1, 5, 10. If the instants of the non-removals or reinsertions are also stored in memory unit 45, the non-removals or reinsertions determined by controller 35 can additionally be evaluated as a function of the determined instants, less current non-removals or reinsertions being given a lesser valuation. Subsequently, the program branches to a program point 130.

At program point 130, controller 35 determines, as a function of the previously determined criteria, the playback probability for the individual storage mediums 1, 5, 10 in the previously described manner. Subsequently, the program branches to a program point 135. At program point 135, controller 35 releases the storage medium having the lowest playback probability for a predefined time. Subsequently, the program branches to a program point 140.

At program point 140, controller 35 checks whether the released storage medium was removed by the user within the predefined time or not reinserted. If this is the case, the program branches to program point 145, otherwise the program branches to program point 155. At program point 145, controller 35 checks whether an additional storage medium to

be inserted into playback device 15 or storage apparatus, arrangement or structure 20 was detected by proximity sensor 25 or in another manner. If this is the case, the program branches to program point 150, otherwise the program is  
5 exited.

At program point 150, controller 35 causes the additional storage medium inserted into the input slot of playback device 15 or of storage apparatus, arrangement or structure 20 to be  
10 drawn in. The program is subsequently exited. At program point 155, controller 35 checks whether there is a storage medium having a greater playback probability in storage apparatus, arrangement or structure 20 or in playback device 15. If this is the case, the program branches to program point 160,  
15 otherwise the program is exited.

At program point 160, controller 35 releases the storage medium having the next greatest (next one up, or next lowest) playback probability to be ejected for the predefined time.  
20 The program subsequently branches back to program point 140.

The trend for playback devices 15 configured as compact disk changers is for increasingly smaller designs. Compact disk changers are playback devices 15 for storage mediums  
25 configured as compact disks, where the compact disk to be played is automatically transported from storage apparatus, arrangement or structure 20 to playback unit 40 and played there.

Due to demands of the automobile manufacturers, playback devices 15, which fit in a so-called 1-DIN housing, are currently being developed for mobile applications in motor vehicles. This particularly small type of construction results in constructions where the compact disks are directly inserted  
35 into playback device 15 via an input slot and transported from there into the appropriate storage space 21, 22, 23 of storage

apparatus, arrangement or structure 20. As a result of the exemplary method and/or exemplary embodiment according to the present invention, the user must no longer select a no longer needed compact disk for ejection prior to inserting an  
5 additional compact disk in the case of an already completely filled storage apparatus, arrangement or structure 20, but a disk is automatically released by controller 35 for ejection as a function of its playback probability.

ABSTRACT OF THE DISCLOSURE

A method for providing user-friendly selection of a storage medium, in particular an optical storage disk, from a plurality of storage mediums. The storage mediums are assigned to a playback device, in particular a compact disk changer, for reading out and reproducing stored data and can be stored in a storage apparatus, arrangement or structure, in which a playback probability is determined for each storage medium, and in which the storage medium having the lowest playback probability is then released to be ejected from the playback device or from the storage apparatus, arrangement or structure.

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## METHOD FOR SELECTING A STORAGE MEDIUM

[Background Information

]

### FIELD OF THE INVENTION

The present invention relates to a method [according to the  
5 definition of the species of the main claim.

]for selecting a storage medium, in particular an optical  
storage disk, from a plurality of storage mediums, which are  
assigned to a playback device, in particular a compact disk  
changer, for reading out and reproducing stored data, and  
10 which can be stored in a storage apparatus, arrangement or  
structure.

### BACKGROUND INFORMATION

Compact disk changer CDC-F 05, for example, where up to ten  
15 different compact disks are assigned to a playback device for  
reading out and reproducing stored data and can be stored in a  
magazine is [known from]discussed in the Blaupunkt catalog  
"Sound und Fahrvergnügen pur. Mobile Kommunikation von  
Blaupunkt. Programm 96/97." [Pure Sound and Driving Pleasure.  
20 Mobile Communication from Blaupunkt. Program 96/97]. In this  
context, a compact disk to be played back in the assigned  
playback device, for example, can be selected.

[Summary of the Invention

25 ]SUMMARY OF THE INVENTION

In contrast, the exemplary method and/or exemplary embodiment  
according to the present invention [and having the features of  
the main claim has]is believed to have the advantage that a  
playback probability is determined for each storage medium,  
30 and that the storage medium having the lowest playback  
probability is released to be ejected from the playback device  
or from the storage [means]apparatus, arrangement or

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structure. In this manner, the decision regarding the ejection of a no longer needed storage medium is automated. This [eliminates]should eliminate or at least reduce the effort for a user to inform himself as to the storage mediums located in the storage [means]apparatus, arrangement or structure, to then select a no longer necessary storage medium, and to be able to release it for ejection. Thus, the user [is]may be spared from obtaining an overview of the storage mediums stored in the storage [means]apparatus, arrangement or structure and selecting the no longer needed storage medium for ejection, e.g. by way of naming the storage mediums in the storage [means]apparatus, arrangement or structure, initiating the play of individual storage mediums or even removing individual storage mediums by way of trial and subsequently examining a label on the individual storage mediums. Thus, the handling time for ejecting a no longer needed storage medium [is]may be significantly reduced.

[As a result of the measures specified in the dependent claims, advantageous further refinements and improvements of the method indicated in the main claim are possible.

]In this context, it [is]may be particularly advantageous that an ejection prompt is generated when the supply [means]apparatus, arrangement or structure for storing the storage mediums is full, or when it is detected, [preferably]which may be by proximity sensors, that an additional storage medium is to be inserted into the playback device or into the storage [means]apparatus, arrangement or structure. In this manner, the user's handling time is solely limited to his specific intention of inserting a new storage medium. In the case of an already completely filled storage [means]apparatus, arrangement or structure, the user [must]may no longer need to select a no longer needed storage medium for ejection prior to an additional storage medium being inserted.

An additional advantage [is]may be that the playback probability is determined as a function of the time that was assigned for the storage medium in question to the playback device for reading out and reproducing stored data, and that the longer this time was, the lower the playback probability for this storage medium is determined to be. In this manner, the storage medium first inserted into the storage [means]apparatus, arrangement or structure or the playback device [can generally]may also be the first to be ejected. Thus, the storage medium that has been in the storage [means]apparatus, arrangement or structure or in the playback device the longest can be the first to be ejected.

A further advantage is that the playback probability [is]may be determined as a function of the frequency with which the stored data of the storage medium in question is read out and reproduced by the playback device, and that the greater this frequency is, the greater (higher) the playback probability for this storage medium is determined to be. In this manner, a preferred storage medium having the greatest playback frequency can be spared the ejection operation.

An additional advantage is that, when determining frequency, less current read-out operations and reproduction operations are given a lesser valuation. In this manner, the historic development of the playback frequency of all of the storage mediums in the playback device can be taken into consideration. As a result, trends in the playback frequency can be recognized and drawn upon as ejection criteria. This can also result in a preferred storage medium being released for ejection at some instant without its playback frequency having to be exceeded by other storage mediums, namely when the preference for the storage medium in question is no longer current.

A further advantage is that in response to the storage medium

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released for ejection for a predefined time not being removed or such a storage medium being reinserted, a storage medium differing from this storage medium and having the next greater (next one up, or next lowest) playback probability is released for ejection. In this manner, the wish of the user to continue to store the storage medium released for ejection in the playback device or in the storage [means] apparatus, arrangement or structure can be taken into consideration, so that the selection of the storage mediums to be ejected is adapted to the needs of the user.

An additional advantage is that the non-removal of a storage medium released for ejection for a predefined time or the reinsertion of such a storage medium is stored, that the playback probability for this storage medium is determined as a function of this stored non-removal or of the stored reinsertion, and that the playback probability for this storage medium in the case of non-removal or reinsertion is determined to be greater. In this manner, the wish of the user to continue to store a storage medium proposed for ejection in the playback device or in the storage [means] apparatus, arrangement or structure is also taken into account for future selection operations in that the playback probability for the corresponding storage medium is accordingly adapted to the user's actions.

A further advantage is that selection operations for ejecting storage mediums initiated at an operator device are stored, and that playback probabilities for the storage mediums [are] may be determined as a function of the stored selection operations. In this manner, the user's strategy can be observed, the playback device being capable of learning from the user's individual selection actions and of emulating them when selecting the storage medium to be provided for ejection. In this manner, the exemplary method for selecting a storage medium is increasingly adapted to the user's needs over time

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and thereby optimized.

[Brief Description of the Drawing

5 An exemplary embodiment of the present invention is represented in the drawing and explained in detail in the following description. ]BRIEF DESCRIPTION OF THE DRAWINGS  
 Figure 1 shows a block diagram of a playback device[, and ].  
 10 Figure 2 shows a flow diagram for carrying out the exemplary method and/or for use in an exemplary embodiment according to the present invention, for selecting a storage medium.

[Description of the Exemplary Embodiment

15 ]DETAILED DESCRIPTION  
 In Figure 1[, 15 designates] is shown a playback device 15, which can be configured as a compact disk changer, for example. Playback device 15 includes a storage  
 [means]apparatus, arrangement or structure 20, which can be  
 20 configured as a magazine of a compact disk changer, for example. Storage [means]apparatus, arrangement or structure 20 includes a first storage space 21, a second storage space 22, and a third storage space 23. A first storage medium 1 is stored in first storage space 21. A second storage medium 5 is  
 25 stored in second storage space 22. A third storage medium 10 is stored in third storage space 23. Storage mediums 1, 5, 10 can, for example, be configured as optical storage disks, i.e., as compact disks or as CD-ROMs or as digital video disks or DVDs. However, storage mediums 1, 5, 10 can also be  
 30 magnetic storage disks, playback device 15 being then configured as a playback device for magnetic storage disks.

Storage [means]apparatus, arrangement or structure 20 is connected at one end to a playback unit 40 for playing back a  
 35 storage medium and at the other end to a controller 35. In addition, a proximity sensor 25, a memory unit 45, and an

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operator device 30 are connected to controller 35. Playback unit 40 is likewise connected to controller 35 as well as to memory unit 45. Proximity sensor 25 is situated in the vicinity of an input slot (not shown in Figure 1) of playback device 15 or of storage [means]apparatus, arrangement or structure 20. Playback unit 40 can be assigned to each of the three storage spaces 21, 22, 23. Figure 1 shows first storage space 21 assigned to playback unit 40.

Via operator device 30, a user of playback device 15 can select one of storage mediums 1, 5, 10 for the data stored on the storage medium to be read out and reproduced via playback unit 40. In this context, first storage medium 1 in first storage space 21, for example, is to have been selected by the user. First storage medium 1 is then transported from first storage space 21 of storage [means]apparatus, arrangement or structure 20 to playback unit 40 and deposited there, so that it can be read out by a read device (not shown in Figure 1) of playback unit 40 and reproduced by a reproduction device (likewise not [represented]shown in Figure 1).

The reproduction device can be an optical display device and/or at least one loudspeaker, depending on whether audio data and/or video data are being read from first storage medium 1. It can be provided that the frequency with which storage mediums 1, 5, 10 are selected for reading out and reproducing the stored data is stored in memory unit 45.

Additionally or alternatively, the sequence in which storage mediums 1, 4, 10 are inserted into playback device 15 or into storage [means]apparatus, arrangement or structure 20 can be stored in memory unit 45. It can also be provided that, using the operator device, the user can select a storage medium in a storage space of storage [means]apparatus, arrangement or structure 20 to be ejected from playback device 15 or from storage [means]apparatus, arrangement or structure 20 via the

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input slot not shown in Figure 1.

For such a selection, the user can, for example, use a naming of storage mediums 1, 5, 10 in storage [means]apparatus, arrangement or structure 20, previously carried out via operator device 30, to orientate himself, as long as a display device (not shown in Figure 1) connected to controller 35 is provided on which each of the names of storage mediums 1, 5, 10 can be represented. The user can also make a selection in that the individual storage mediums 1, 5, 10 are supplied one after another to playback unit 40 to initiate play, i.e., to be partially read out and reproduced, so that the user can select the storage medium to be ejected based on the at least partial reproduction of the data stored on each storage medium 1, 5, 10.

Furthermore, the selection could be carried out via an ejection operating element (not shown in Figure 1) of operator device 30, activating the ejection operating element resulting in storage mediums 1, 5, 10 being able to be ejected in succession from playback device 15 or from storage [means]apparatus, arrangement or structure 20, so that the user can make a selection based on the label of the storage medium in question and can reinsert the storage mediums not selected into playback device 15 or into storage [means]apparatus, arrangement or structure 20, which, together with playback unit 40, e.g. a compact disk changer, can also be situated outside of playback device 15.

In this context, it can be provided that the selection operations initiated by the user at operator device 30 for ejecting storage mediums 1, 5, 10 are registered and are stored in memory unit 45 as a result of controller 35, so that the selection operations carried out by the user for ejecting storage mediums 1, 5, 10 are stored in memory unit 45.

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Playback device 15 has a function via which a storage medium 1, 5, 10 stored in storage [means]apparatus, arrangement or structure 20 or in playback unit 40 is automatically selected to be ejected, i.e., without the user making a selection. For this purpose, a playback probability is determined for each storage medium 1, 5, 10. The storage medium having the lowest playback probability is then released to be ejected from playback device 15 or from storage [means]apparatus, arrangement or structure 20.

In this context, according to Figure 1, first storage medium 1 should have the lowest playback probability and be released for ejection from playback device 15 or from storage [means]apparatus, arrangement or structure 20, as is indicated by the corresponding arrow in Figure 1. In this context, first storage medium 1 can be released in the event that there is an ejection prompt. The existence of an ejection prompt can also be a prerequisite for controller 35 to calculate the playback probabilities of the individual storage mediums 1, 5, 10.

In the present exemplary embodiment, two different possibilities for producing such an ejection prompt are described. In this context, a suitable ejection prompt can be generated by operating, e.g. for a predefined minimum duration, the ejection operating element (not shown in Figure 1) of operator device 30 in a characteristic manner, or by operating an additional ejection operating element, e.g. in the form of a button, of operator device 30. In the case of a storage [means]apparatus, arrangement or structure 20 offset from playback device 15, a corresponding ejection operating element can also be provided at storage [means]apparatus, arrangement or structure 20.

[An additional possibility for generating]The generation of the ejection prompt can also be carried out or performed by

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proximity sensor 25, for example. In the case that proximity sensor 25 detects in the vicinity of the input slot at playback device 15 or at storage [means]apparatus, arrangement or structure 20 that an additional storage medium is to be inserted into playback device 15 or into storage [means]apparatus, arrangement or structure 20, in that the additional storage medium is brought into the vicinity of the corresponding input slot and, as such, into the range of effect of proximity sensor 25, the ejection prompt is automatically generated, provided that storage [means]apparatus, arrangement or structure 20 for storing storage mediums 1, 5, 10 is full.

In this context, storage [means]apparatus, arrangement or structure 20 is detected as full when the number of storage mediums 1, 5, 10 in playback device 15 corresponds with the number of storage spaces 21, 22, 23 of storage [means]apparatus, arrangement or structure 20, at least one storage space 21, 22, 23 also being able to be empty, and the corresponding storage medium being in playback unit 40 to be read out and reproduced, for example. In this context, storage [means]apparatus, arrangement or structure 20 can have more or less than three storage spaces 21, 22, 23.

Different criteria can be provided individually or in combination for determining the playback probability of the individual storage mediums 1, 5, 10. In this context, the playback probability can be determined as a function of the time that was assigned for the respective storage medium 1, 5, 10 to playback device 15 for reading out and reproducing stored data. This is then possible when the sequence in which storage mediums 1, 5, 10 were inserted into playback device 15 or into storage [means]apparatus, arrangement or structure 20 is stored in memory unit 45.

In this context, the storage medium inserted first has been

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assigned to playback device 15 the longest. In this context, the playback probability for the individual storage mediums 1, 5, 10 is determined by controller 35, and the longer the time, i.e., the earlier the corresponding storage medium 1, 5, 10 was inserted into playback device 15 or into storage [means] apparatus, arrangement or structure 20, the lower the playback probability.

[  
]

Additionally or alternatively, the playback probability can be determined as a function of the frequency with which the stored data of each storage medium 1, 5, 10 are read out and reproduced by playback device 15. Prerequisite for this is that the corresponding frequency or playback instant is also stored in memory unit 45. In this context, the greater this frequency is, the greater the playback probability determined in controller 35 is for the particular storage medium 1, 5, 10.

In this context, less current read-out operations and reproduction operations can also be given a lesser valuation for determining the frequency. In this manner, the historic development of the playback frequency of all of storage mediums 1, 5, 10 located in playback device 15 are taken into consideration, provided that the corresponding playback instant of these storage mediums 1, 5, 10 are stored in memory unit 45, which, for this purpose, [is preferably] may be configured as a non-volatile memory. Therefore, trends in the playback frequency can be detected by controller 35 and drawn upon as ejection criteria.

Additionally or alternatively to the described criteria for determining the playback probability, it can also be provided that, in the case that the user's selection operations initiated at operator device 30, for ejecting storage mediums 1, 5, 10 are also stored in memory unit 45, the playback

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probabilities for storage mediums 1, 5, 10 [are] may be  
determined as a function of these stored selection operations.  
Consequently, controller 35 can observe the user's strategy  
for selecting storage mediums to be ejected and learn from the  
5 user's individual selection actions, so that the selection  
carried out by controller 35 is increasingly adapted to the  
user's needs over time and, thus, optimized.

Given the existence of an ejection prompt, the storage medium  
10 1, 5, 10 having the lowest playback probability is released by  
controller 35 for ejection. In this context, the release [is  
preferably] may be carried out for a predefined time. According  
to Figure 1, first storage medium 1, for example, should have  
the lowest playback probability and, thus, be released. If  
15 first storage medium 1 is not removed after the predefined  
time or is reinserted into playback device 15 or into storage  
[means] apparatus, arrangement or structure 20, controller 35  
recognizes that the user does not accept its selection and  
releases for ejection a storage medium 5, 10 other than  
20 storage medium 1, having the next greatest (next one up, or  
next lowest) playback probability. [ In this contest, it can  
also be provided that]

In this context, the exemplary method and/or exemplary  
25 embodiment may provide for the non-removal of a storage medium  
1, 5, 10 released to be ejected for a predefined time or the  
reinsertion of such a storage medium 1, 5, 10 is stored in  
memory unit 45, and that controller 35 determines the playback  
probability for this storage medium 1, 5, 10 as a function of  
30 the stored non-removal or the stored reinsertion, the playback  
probability for this storage medium 1, 5, 10 being greater in  
the case of a stored non-removal or reinsertion.

In this context, the number of non-removals or reinsertions of  
35 the corresponding storage medium 1, 5, 10 can also be stored  
in memory unit 45, controller 35 determining the playback

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probability to be greater for the corresponding storage medium 1, 5, 10 when a greater number of non-removals or reinsertions has been stored.

[

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Also in this manner, controller 35 adapts its selection method to the needs of the user, in that it takes the user's rejection of its selection proposals into account when determining the playback probability for storage mediums 1, 5, 10.

Analogously to the criteria for the frequency for reading out and reproducing a storage medium 1, 5, 10, it can further be provided that less current non-removals and reinsertions are given a lesser valuation when determining playback frequency. For this purpose, the historic development of the non-removals or reinsertions of all of the storage mediums 1, 5, 10 located in playback device 15 or in storage [means]apparatus, arrangement or structure 20 must be accordingly stored in memory unit 45, so that in this manner trends in the non-removal or reinsertion of storage mediums 1, 5, 10 can be likewise detected and drawn upon as ejection criteria.

In the event that controller 35 determines the lowest playback probability for more than one storage medium, i.e., the same lowest playback probability for the storage mediums, controller 35 randomly selects one of these storage mediums for ejection.

Figure 2 shows a flow diagram for the functioning method of controller 35, consideration, for example, of all indicated criteria for determining the playback probability being provided. At a program point 100, controller 35 checks whether there is an ejection prompt. If this is the case, the program branches to program point 105, otherwise the program is exited. At program point 105, controller 35 determines from

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memory unit 45 the times that were assigned for each storage medium 1, 5, 10 to playback device 15 for reading out and reproducing stored data.

5 Subsequently, the program branches to a program point 110. At program point 110, controller 35 determines from memory unit 45 the frequency with which the stored data of each storage medium 1, 5, 10 are read out or reproduced by playback device 15. In this context, the controller also takes from memory  
10 unit 45 the instants of the read-out operations and reproduction operations necessary for determining frequency. In this context, less current read-out operations and reproduction operations are given a lesser valuation by controller 35 when calculating the frequency for the  
15 individual storage mediums 1, 5, 10.

Subsequently, the program branches to a program point 120. At program point 120, controller 35 determines from memory unit 45 the selection operations initiated at operator device 30  
20 for ejecting the individual storage mediums 1, 5, 10. In the event that the instants of the selection operations for ejecting the individual storage mediums 1, 5, 10, initiated at operator device 30 by the user are also stored in memory unit 45, these instants can be taken into consideration in addition  
25 to the valuation of the selection operations determined by controller 35, less current selection operations being given a lesser valuation. The program subsequently branches to a program point 125.

30 At program point 125, controller 35 determines from memory unit 45 the non-removals of storage mediums 1, 5, 10 released for ejection for a predefined time or the reinsertions of such storage mediums 1, 5, 10. If the instants of the non-removals or reinsertions are also stored in memory unit 45, the  
35 non-removals or reinsertions determined by controller 35 can additionally be evaluated as a function of the determined

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instants, less current non-removals or reinsertions being given a lesser valuation. Subsequently, the program branches to a program point 130.

5 At program point 130, controller 35 determines, as a function of the previously determined criteria, the playback probability for the individual storage mediums 1, 5, 10 in the previously described manner. Subsequently, the program branches to a program point 135. At program point 135,  
10 controller 35 releases the storage medium having the lowest playback probability for a predefined time. Subsequently, the program branches to a program point 140.

At program point 140, controller 35 checks whether the  
15 released storage medium was removed by the user within the predefined time or not reinserted. If this is the case, the program branches to program point 145, otherwise the program branches to program point 155. At program point 145,  
20 controller 35 checks whether an additional storage medium to be inserted into playback device 15 or storage [means]apparatus, arrangement or structure 20 was detected by proximity sensor 25 or in another manner. If this is the case, the program branches to program point 150, otherwise the program is exited.

25 At program point 150, controller 35 causes the additional storage medium inserted into the input slot of playback device 15 or of storage [means]apparatus, arrangement or structure 20 to be drawn in. The program is subsequently exited. At program  
30 point 155, controller 35 checks whether there is a storage medium having a greater playback probability in storage [means]apparatus, arrangement or structure 20 or in playback device 15. If this is the case, the program branches to program point 160, otherwise the program is exited.

35 At program point 160, controller 35 releases the storage

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medium having the next greatest (next one up, or next lowest) playback probability to be ejected for the predefined time. The program subsequently branches back to program point 140.

5 The trend for playback devices 15 configured as compact disk changers is for increasingly smaller designs. Compact disk changers are playback devices 15 for storage mediums configured as compact disks, where the compact disk to be played is automatically transported from storage  
10 [means]apparatus, arrangement or structure 20 to playback unit 40 and played there.

Due to demands of the automobile manufacturers, playback devices 15, which fit in a so-called 1-DIN housing, are  
15 currently being developed for mobile applications in motor vehicles. This particularly small type of construction results in constructions where the compact disks are directly inserted into playback device 15 via an input slot and transported from there into the appropriate storage space 21, 22, 23 of storage  
20 [means]apparatus, arrangement or structure 20. As a result of the exemplary method and/or exemplary embodiment according to the present invention, the user must no longer select a no longer needed compact disk for ejection prior to inserting an additional compact disk in the case of an already completely  
25 filled storage [means]apparatus, arrangement or structure 20, but a disk is automatically released by controller 35 for ejection as a function of its playback probability.

[Abstract]

ABSTRACT OF THE DISCLOSURE

A method [is proposed for the] for providing user-friendly selection of a storage medium[ (1)], in particular an optical storage disk, from a plurality of storage mediums[ (1, 5, 10)]. The storage mediums[ (1, 5, 10)] are assigned to a playback device[ (15)], in particular a compact disk changer, for reading out and reproducing stored data and can be stored in a storage [means (20). A] apparatus, arrangement or structure, in which a playback probability is determined for each storage medium[ (1), (5, 10)]. T] and in which the storage medium[ (1)] having the lowest playback probability is then released to be ejected from the playback device [(15) ] or from the storage [means (20)] apparatus, arrangement or structure.

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[10191/1882]

## METHOD FOR SELECTING A STORAGE MEDIUM

### Background Information

The present invention relates to a method according to the definition of the species of the main claim.

5

Compact disk changer CDC-F 05, for example, where up to ten different compact disks are assigned to a playback device for reading out and reproducing stored data and can be stored in a magazine is known from the Blaupunkt catalog "Sound und  
10 Fahrvergnügen pur. Mobile Kommunikation von Blaupunkt. Programm 96/97." [Pure Sound and Driving Pleasure. Mobile Communication from Blaupunkt. Program 96/97]. In this context, a compact disk to be played back in the assigned playback device, for example, can be selected.

15

### Summary of the Invention

In contrast, the method according to the present invention and having the features of the main claim has the advantage that a  
20 playback probability is determined for each storage medium, and that the storage medium having the lowest playback probability is released to be ejected from the playback device or from the storage means. In this manner, the decision regarding the ejection of a no longer needed storage medium is  
25 automated. This eliminates the effort for a user to inform himself as to the storage mediums located in the storage means, to then select a no longer necessary storage medium, and to be able to release it for ejection. Thus, the user is spared from obtaining an overview of the storage mediums  
30 stored in the storage means and selecting the no longer needed storage medium for ejection, e.g. by way of naming the storage mediums in the storage means, initiating the play of



individual storage mediums or even removing individual storage mediums by way of trial and subsequently examining a label on the individual storage mediums. Thus, the handling time for ejecting a no longer needed storage medium is significantly reduced.

As a result of the measures specified in the dependent claims, advantageous further refinements and improvements of the method indicated in the main claim are possible.

In this context, it is particularly advantageous that an ejection prompt is generated when the supply means for storing the storage mediums is full, or when it is detected, preferably by proximity sensors, that an additional storage medium is to be inserted into the playback device or into the storage means. In this manner, the user's handling time is solely limited to his specific intention of inserting a new storage medium. In the case of an already completely filled storage means, the user must no longer select a no longer needed storage medium for ejection prior to an additional storage medium being inserted.

An additional advantage is that the playback probability is determined as a function of the time that was assigned for the storage medium in question to the playback device for reading out and reproducing stored data, and that the longer this time was, the lower the playback probability for this storage medium is determined to be. In this manner, the storage medium first inserted into the storage means or the playback device can generally also be the first to be ejected. Thus, the storage medium that has been in the storage means or in the playback device the longest can be the first to be ejected.

A further advantage is that the playback probability is determined as a function of the frequency with which the stored data of the storage medium in question is read out and

reproduced by the playback device, and that the greater this frequency is, the greater (higher) the playback probability for this storage medium is determined to be. In this manner, a preferred storage medium having the greatest playback  
5 frequency can be spared the ejection operation.

An additional advantage is that, when determining frequency, less current read-out operations and reproduction operations are given a lesser valuation. In this manner, the historic  
10 development of the playback frequency of all of the storage mediums in the playback device can be taken into consideration. As a result, trends in the playback frequency can be recognized and drawn upon as ejection criteria. This can also result in a preferred storage medium being released  
15 for ejection at some instant without its playback frequency having to be exceeded by other storage mediums, namely when the preference for the storage medium in question is no longer current.

A further advantage is that in response to the storage medium released for ejection for a predefined time not being removed or such a storage medium being reinserted, a storage medium differing from this storage medium and having the next  
20 greatest (next one up, or next lowest) playback probability is released for ejection. In this manner, the wish of the user to continue to store the storage medium released for ejection in the playback device or in the storage means can be taken into consideration, so that the selection of the storage mediums to be ejected is adapted to the needs of the user.

An additional advantage is that the non-removal of a storage medium released for ejection for a predefined time or the reinsertion of such a storage medium is stored, that the  
30 playback probability for this storage medium is determined as a function of this stored non-removal or of the stored  
35 reinsertion, and that the playback probability for this

storage medium in the case of non-removal or reinsertion is determined to be greater. In this manner, the wish of the user to continue to store a storage medium proposed for ejection in the playback device or in the storage means is also taken into account for future selection operations in that the playback probability for the corresponding storage medium is accordingly adapted to the user's actions.

A further advantage is that selection operations for ejecting storage mediums initiated at an operator device are stored, and that playback probabilities for the storage mediums are determined as a function of the stored selection operations. In this manner, the user's strategy can be observed, the playback device being capable of learning from the user's individual selection actions and of emulating them when selecting the storage medium to be provided for ejection. In this manner, the method for selecting a storage medium is increasingly adapted to the user's needs over time and thereby optimized.

#### Brief Description of the Drawing

An exemplary embodiment of the present invention is represented in the drawing and explained in detail in the following description. Figure 1 shows a block diagram of a playback device, and Figure 2 shows a flow diagram for carrying out the method according to the present invention, for selecting a storage medium.

#### Description of the Exemplary Embodiment

In Figure 1, 15 designates a playback device, which can be configured as a compact disk changer, for example. Playback device 15 includes a storage means 20, which can be configured as a magazine of a compact disk changer, for example. Storage means 20 includes a first storage space 21, a second storage

space 22, and a third storage space 23. A first storage medium 1 is stored in first storage space 21. A second storage medium 5 is stored in second storage space 22. A third storage medium 10 is stored in third storage space 23. Storage mediums 1, 5, 10 can, for example, be configured as optical storage disks, i.e., as compact disks or as CD-ROMs or as digital video disks or DVDs. However, storage mediums 1, 5, 10 can also be magnetic storage disks, playback device 15 being then configured as a playback device for magnetic storage disks.

Storage means 20 is connected at one end to a playback unit 40 for playing back a storage medium and at the other end to a controller 35. In addition, a proximity sensor 25, a memory unit 45, and an operator device 30 are connected to controller 35. Playback unit 40 is likewise connected to controller 35 as well as to memory unit 45. Proximity sensor 25 is situated in the vicinity of an input slot (not shown in Figure 1) of playback device 15 or of storage means 20. Playback unit 40 can be assigned to each of the three storage spaces 21, 22, 23. Figure 1 shows first storage space 21 assigned to playback unit 40.

Via operator device 30, a user of playback device 15 can select one of storage mediums 1, 5, 10 for the data stored on the storage medium to be read out and reproduced via playback unit 40. In this context, first storage medium 1 in first storage space 21, for example, is to have been selected by the user. First storage medium 1 is then transported from first storage space 21 of storage means 20 to playback unit 40 and deposited there, so that it can be read out by a read device (not shown in Figure 1) of playback unit 40 and reproduced by a reproduction device (likewise not represented in Figure 1). The reproduction device can be an optical display device and/or at least one loudspeaker, depending on whether audio data and/or video data are being read from first storage medium 1. It can be provided that the frequency with which storage mediums 1, 5, 10 are selected for reading out and

reproducing the stored data is stored in memory unit 45.

Additionally or alternatively, the sequence in which storage mediums 1, 4, 10 are inserted into playback device 15 or into storage means 20 can be stored in memory unit 45. It can also  
 5 be provided that, using the operator device, the user can select a storage medium in a storage space of storage means 20 to be ejected from playback device 15 or from storage means 20 via the input slot not shown in Figure 1. For such a

selection, the user can, for example, use a naming of storage  
 10 mediums 1, 5, 10 in storage means 20, previously carried out via operator device 30, to orientate himself, as long as a display device (not shown in Figure 1) connected to controller 35 is provided on which each of the names of storage mediums 1, 5, 10 can be represented. The user can also make a

15 selection in that the individual storage mediums 1, 5, 10 are supplied one after another to playback unit 40 to initiate play, i.e., to be partially read out and reproduced, so that the user can select the storage medium to be ejected based on the at least partial reproduction of the data stored on each

20 storage medium 1, 5, 10. Furthermore, the selection could be carried out via an ejection operating element (not shown in Figure 1) of operator device 30, activating the ejection operating element resulting in storage mediums 1, 5, 10 being

25 able to be ejected in succession from playback device 15 or from storage means 20, so that the user can make a selection based on the label of the storage medium in question and can reinsert the storage mediums not selected into playback device 15 or into storage means 20, which, together with playback unit 40, e.g. a compact disk changer, can also be situated  
 30 outside of playback device 15.

In this context, it can be provided that the selection operations initiated by the user at operator device 30 for ejecting storage mediums 1, 5, 10 are registered and are  
 35 stored in memory unit 45 as a result of controller 35, so that the selection operations carried out by the user for ejecting

storage mediums 1, 5, 10 are stored in memory unit 45.

Playback device 15 has a function via which a storage medium 1, 5, 10 stored in storage means 20 or in playback unit 40 is automatically selected to be ejected, i.e., without the user making a selection. For this purpose, a playback probability is determined for each storage medium 1, 5, 10. The storage medium having the lowest playback probability is then released to be ejected from playback device 15 or from storage means 20. In this context, according to Figure 1, first storage medium 1 should have the lowest playback probability and be released for ejection from playback device 15 or from storage means 20, as is indicated by the corresponding arrow in Figure 1. In this context, first storage medium 1 can be released in the event that there is an ejection prompt. The existence of an ejection prompt can also be a prerequisite for controller 35 to calculate the playback probabilities of the individual storage mediums 1, 5, 10. In the present exemplary embodiment, two different possibilities for producing such an ejection prompt are described. In this context, a suitable ejection prompt can be generated by operating, e.g. for a predefined minimum duration, the ejection operating element (not shown in Figure 1) of operator device 30 in a characteristic manner, or by operating an additional ejection operating element, e.g. in the form of a button, of operator device 30. In the case of a storage means 20 offset from playback device 15, a corresponding ejection operating element can also be provided at storage means 20.

An additional possibility for generating the ejection prompt can be carried out by proximity sensor 25, for example. In the case that proximity sensor 25 detects in the vicinity of the input slot at playback device 15 or at storage means 20 that an additional storage medium is to be inserted into playback device 15 or into storage means 20, in that the additional storage medium is brought into the vicinity of the

corresponding input slot and, as such, into the range of effect of proximity sensor 25, the ejection prompt is automatically generated, provided that storage means 20 for storing storage mediums 1, 5, 10 is full. In this context, storage means 20 is detected as full when the number of storage mediums 1, 5, 10 in playback device 15 corresponds with the number of storage spaces 21, 22, 23 of storage means 20, at least one storage space 21, 22, 23 also being able to be empty, and the corresponding storage medium being in playback unit 40 to be read out and reproduced, for example. In this context, storage means 20 can have more or less than three storage spaces 21, 22, 23.

Different criteria can be provided individually or in combination for determining the playback probability of the individual storage mediums 1, 5, 10. In this context, the playback probability can be determined as a function of the time that was assigned for the respective storage medium 1, 5, 10 to playback device 15 for reading out and reproducing stored data. This is then possible when the sequence in which storage mediums 1, 5, 10 were inserted into playback device 15 or into storage means 20 is stored in memory unit 45. In this context, the storage medium inserted first has been assigned to playback device 15 the longest. In this context, the playback probability for the individual storage mediums 1, 5, 10 is determined by controller 35, and the longer the time, i.e., the earlier the corresponding storage medium 1, 5, 10 was inserted into playback device 15 or into storage means 20, the lower the playback probability.

Additionally or alternatively, the playback probability can be determined as a function of the frequency with which the stored data of each storage medium 1, 5, 10 are read out and reproduced by playback device 15. Prerequisite for this is that the corresponding frequency or playback instant is also stored in memory unit 45. In this context, the greater this

frequency is, the greater the playback probability determined in controller 35 is for the particular storage medium 1, 5, 10.

5 In this context, less current read-out operations and reproduction operations can also be given a lesser valuation for determining the frequency. In this manner, the historic development of the playback frequency of all of storage  
10 mediums 1, 5, 10 located in playback device 15 are taken into consideration, provided that the corresponding playback instant of these storage mediums 1, 5, 10 are stored in memory unit 45, which, for this purpose, is preferably configured as a non-volatile memory. Therefore, trends in the playback  
15 frequency can be detected by controller 35 and drawn upon as ejection criteria.

Additionally or alternatively to the described criteria for determining the playback probability, it can also be provided that, in the case that the user's selection operations  
20 initiated at operator device 30, for ejecting storage mediums 1, 5, 10 are also stored in memory unit 45, the playback probabilities for storage mediums 1, 5, 10 are determined as a function of these stored selection operations. Consequently, controller 35 can observe the user's strategy for selecting  
25 storage mediums to be ejected and learn from the user's individual selection actions, so that the selection carried out by controller 35 is increasingly adapted to the user's needs over time and, thus, optimized.

30 Given the existence of an ejection prompt, the storage medium 1, 5, 10 having the lowest playback probability is released by controller 35 for ejection. In this context, the release is preferably carried out for a predefined time. According to  
35 Figure 1, first storage medium 1, for example, should have the lowest playback probability and, thus, be released. If first storage medium 1 is not removed after the predefined time or



is reinserted into playback device 15 or into storage means 20, controller 35 recognizes that the user does not accept its selection and releases for ejection a storage medium 5, 10 other than storage medium 1, having the next greatest (next one up, or next lowest) playback probability. In this contest, it can also be provided that the non-removal of a storage medium 1, 5, 10 released to be ejected for a predefined time or the reinsertion of such a storage medium 1, 5, 10 is stored in memory unit 45, and that controller 35 determines the playback probability for this storage medium 1, 5, 10 as a function of the stored non-removal or the stored reinsertion, the playback probability for this storage medium 1, 5, 10 being greater in the case of a stored non-removal or reinsertion. In this context, the number of non-removals or reinsertions of the corresponding storage medium 1, 5, 10 can also be stored in memory unit 45, controller 35 determining the playback probability to be greater for the corresponding storage medium 1, 5, 10 when a greater number of non-removals or reinsertions has been stored.

Also in this manner, controller 35 adapts its selection method to the needs of the user, in that it takes the user's rejection of its selection proposals into account when determining the playback probability for storage mediums 1, 5, 10.

Analogously to the criteria for the frequency for reading out and reproducing a storage medium 1, 5, 10, it can further be provided that less current non-removals and reinsertions are given a lesser valuation when determining playback frequency. For this purpose, the historic development of the non-removals or reinsertions of all of the storage mediums 1, 5, 10 located in playback device 15 or in storage means 20 must be accordingly stored in memory unit 45, so that in this manner trends in the non-removal or reinsertion of storage mediums 1, 5, 10 can be likewise detected and drawn upon as ejection

criteria.

In the event that controller 35 determines the lowest playback probability for more than one storage medium, i.e., the same  
5 lowest playback probability for the storage mediums, controller 35 randomly selects one of these storage mediums for ejection.

Figure 2 shows a flow diagram for the functioning method of  
10 controller 35, consideration, for example, of all indicated criteria for determining the playback probability being provided. At a program point 100, controller 35 checks whether there is an ejection prompt. If this is the case, the program branches to program point 105, otherwise the program is  
15 exited. At program point 105, controller 35 determines from memory unit 45 the times that were assigned for each storage medium 1, 5, 10 to playback device 15 for reading out and reproducing stored data. Subsequently, the program branches to a program point 110. At program point 110, controller 35  
20 determines from memory unit 45 the frequency with which the stored data of each storage medium 1, 5, 10 are read out or reproduced by playback device 15. In this context, the controller also takes from memory unit 45 the instants of the read-out operations and reproduction operations necessary for  
25 determining frequency. In this context, less current read-out operations and reproduction operations are given a lesser valuation by controller 35 when calculating the frequency for the individual storage mediums 1, 5, 10. Subsequently, the program branches to a program point 120. At program point 120,  
30 controller 35 determines from memory unit 45 the selection operations initiated at operator device 30 for ejecting the individual storage mediums 1, 5, 10. In the event that the instants of the selection operations for ejecting the individual storage mediums 1, 5, 10, initiated at operator  
35 device 30 by the user are also stored in memory unit 45, these instants can be taken into consideration in addition to the

valuation of the selection operations determined by controller 35, less current selection operations being given a lesser valuation. The program subsequently branches to a program point 125. At program point 125, controller 35 determines from  
5 memory unit 45 the non-removals of storage mediums 1, 5, 10 released for ejection for a predefined time or the reinsertions of such storage mediums 1, 5, 10. If the instants of the non-removals or reinsertions are also stored in memory unit 45, the non-removals or reinsertions determined by  
10 controller 35 can additionally be evaluated as a function of the determined instants, less current non-removals or reinsertions being given a lesser valuation. Subsequently, the program branches to a program point 130. At program point 130, controller 35 determines, as a function of the previously  
15 determined criteria, the playback probability for the individual storage mediums 1, 5, 10 in the previously described manner. Subsequently, the program branches to a program point 135. At program point 135, controller 35 releases the storage medium having the lowest playback  
20 probability for a predefined time. Subsequently, the program branches to a program point 140. At program point 140, controller 35 checks whether the released storage medium was removed by the user within the predefined time or not reinserted. If this is the case, the program branches to  
25 program point 145, otherwise the program branches to program point 155. At program point 145, controller 35 checks whether an additional storage medium to be inserted into playback device 15 or storage means 20 was detected by proximity sensor 25 or in another manner. If this is the case, the program  
30 branches to program point 150, otherwise the program is exited. At program point 150, controller 35 causes the additional storage medium inserted into the input slot of playback device 15 or of storage means 20 to be drawn in. The program is subsequently exited. At program point 155,  
35 controller 35 checks whether there is a storage medium having a greater playback probability in storage means 20 or in

5 playback device 15. If this is the case, the program branches to program point 160, otherwise the program is exited. At program point 160, controller 35 releases the storage medium having the next greatest (next one up, or next lowest) playback probability to be ejected for the predefined time. The program subsequently branches back to program point 140.

10 The trend for playback devices 15 configured as compact disk changers is for increasingly smaller designs. Compact disk changers are playback devices 15 for storage mediums configured as compact disks, where the compact disk to be played is automatically transported from storage means 20 to playback unit 40 and played there.

15 Due to demands of the automobile manufacturers, playback devices 15, which fit in a so-called 1-DIN housing, are currently being developed for mobile applications in motor vehicles. This particularly small type of construction results in constructions where the compact disks are directly inserted into playback device 15 via an input slot and transported from there into the appropriate storage space 21, 22, 23 of storage means 20. As a result of the method according to the present invention, the user must no longer select a no longer needed compact disk for ejection prior to inserting an additional compact disk in the case of an already completely filled storage means 20, but a disk is automatically released by controller 35 for ejection as a function of its playback probability.

What is claimed is:

1. A method for selecting a storage medium (1), in particular an optical storage disk, from a plurality of storage mediums (1, 5, 10), which are assigned to a playback device (15), in particular a compact disk changer, for reading out and reproducing stored data, and which can be stored in a storage means (20), wherein a playback probability is determined for each storage medium (1, 5, 10), and the storage medium (1) having the lowest playback probability is selected to be ejected from the playback device (15) or from the storage means (20).

2. The method as recited in Claim 1, wherein the storage medium (1) is released in the case that there is an ejection prompt.

3. The method as recited in Claim 2, wherein an ejection prompt is generated when the supply means (20) for storing the storage mediums (1, 5, 10) is full, and when it is detected, preferably by a proximity sensor (25) that an additional storage medium is to be inserted into the playback device (15) or into the storage means (20).

4. The method as recited in Claim 2 or 3, wherein the ejection prompt is generated when a suitable operating function is activated, preferably by manipulating a button, at the playback device (15) or at the storage means (20).

5. The method as recited in one of the preceding claims, wherein the playback probability is determined as a function of the time that was assigned for the respective storage medium (1, 5, 10), and the longer this time was, the lower the playback probability for this storage medium (1, 5, 10) is determined to be.

6. The method as recited in one of the preceding claims, wherein the playback probability is determined as a function of the frequency with which the stored data of the particular storage medium (1, 5, 10) is read out and reproduced by the playback device (15), and the greater this frequency is, the greater the playback probability for this storage medium (1, 5, 10) is determined to be.

7. The method as recited in Claim 6, wherein less current read-out operations and reproduction operations are given a lesser valuation when determining frequency.

8. The method as recited in one of the preceding claims, wherein in response to the storage medium (1) released for ejection for a predefined time not being removed or such a storage medium (1) being reinserted, a storage medium (5, 10) differing from this storage medium (1) and having the next greatest (next one up, or next lowest) playback probability is released for ejection.

9. The method as recited in one of the preceding claims, wherein the non-removal of a storage medium (1, 5, 10) released for ejection for a predefined time or the reinsertion of such a storage medium (1, 5, 10) is stored; the playback probability for this storage medium (1, 5, 10) is determined as a function of the stored non-removal or the stored reinsertion; and that the playback probability for this storage medium (1, 5, 10) is determined to be greater in the case of non-removal or reinsertion.

10. The method as recited in one of the preceding claims, wherein selection operations for ejecting a storage medium (1, 5, 10) initiated at an operator device (30) are stored, and the playback probabilities for the storage mediums (1, 5, 10) are determined as a function of the stored selection operations.

## Abstract

A method is proposed for the user-friendly selection of a storage medium (1), in particular an optical storage disk, from a plurality of storage mediums (1, 5, 10). The storage mediums (1, 5, 10) are assigned to a playback device (15), in particular a compact disk changer, for reading out and reproducing stored data and can be stored in a storage means (20). A playback probability is determined for each storage medium (1, 5, 10). The storage medium (1) having the lowest playback probability is then released to be ejected from the playback device (15) or from the storage means (20).

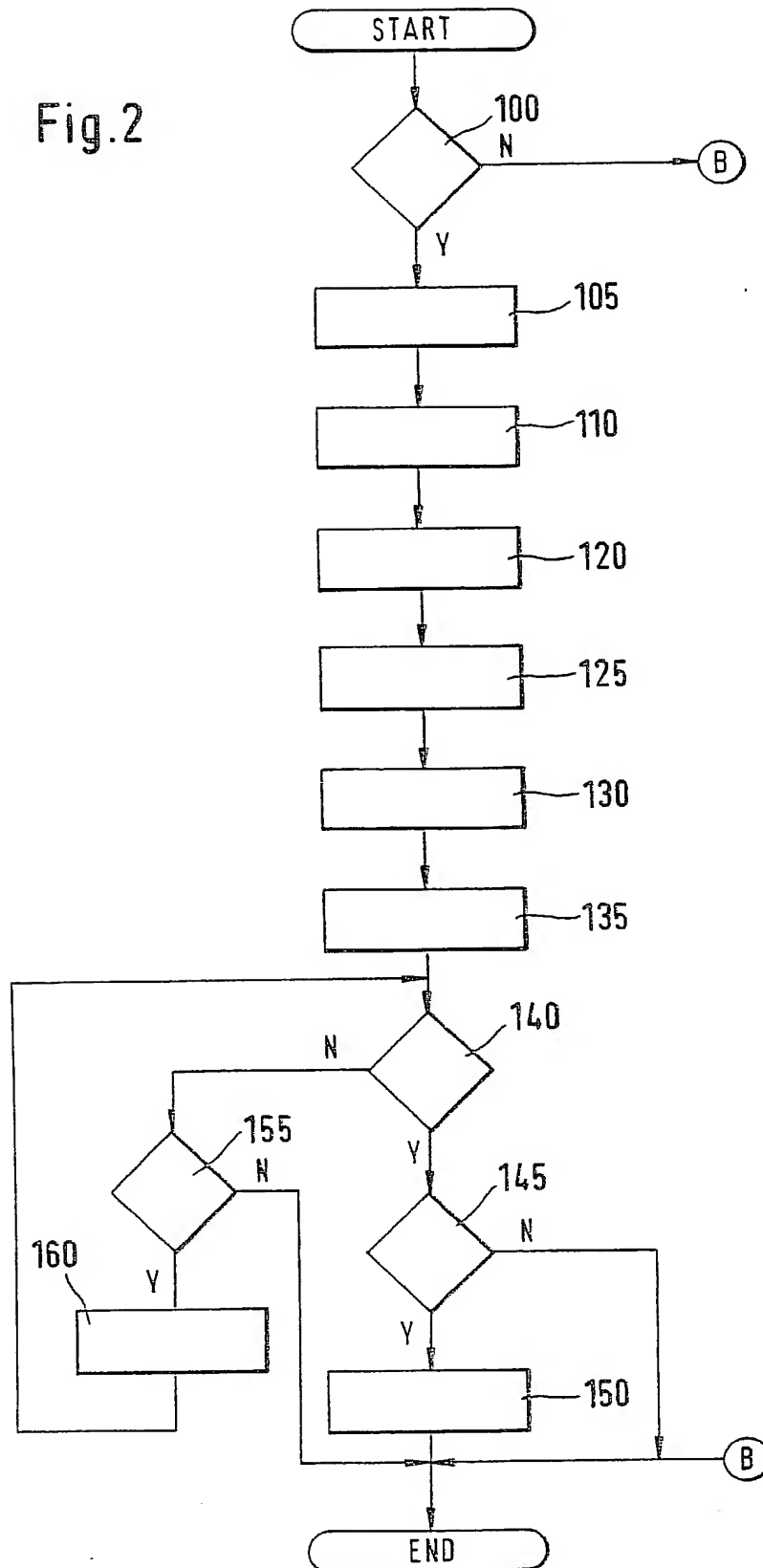
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Fig.2



[10191/1882]

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **METHOD FOR SELECTING A STORAGE MEDIUM**, the specification of which was filed as PCT International Application No. **PCT/DE00/01166** on April 14, 2000.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application(s) for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)

Number	Country filed	Day/month/year	Priority Claimed Under 35 USC 119
199 19 032.1	Fed. Rep. of Germany	27 April 1999	Yes

And I hereby appoint Richard L. Mayer (Reg. No. 22,490) and Gerard A. Messina (Reg. No. 35,952) my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

Please address all communications regarding this application to:

KENYON & KENYON  
One Broadway  
New York, New York 10004  
**CUSTOMER NO. 26646**

Please direct all telephone calls to Richard L. Mayer at (212) 425-7200.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful and false statements may jeopardize the validity of the application or any patent issued thereon.

1-00

Inventor: Volker BECKERInventor's Signature: Volker BeckerDate: 19. October 2001

Residence: Sohldfeld 71  
31139 Hildesheim DeX  
Federal Republic of Germany

Citizenship: Federal Republic of Germany

Post Office Address: Same as above.